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(54) Stabilizer bar lateral retainer collar

(57) An anti-shift collar (38) prevents lateral movement of a stabilizer bar assembly (30). The anti-shift collar (38) is mounted to a fully formed stabilizer bar (30)

and then crimped to a central segment (32) of the stabilizer bar at the desired position and is locked to the central segment (32) thereby.

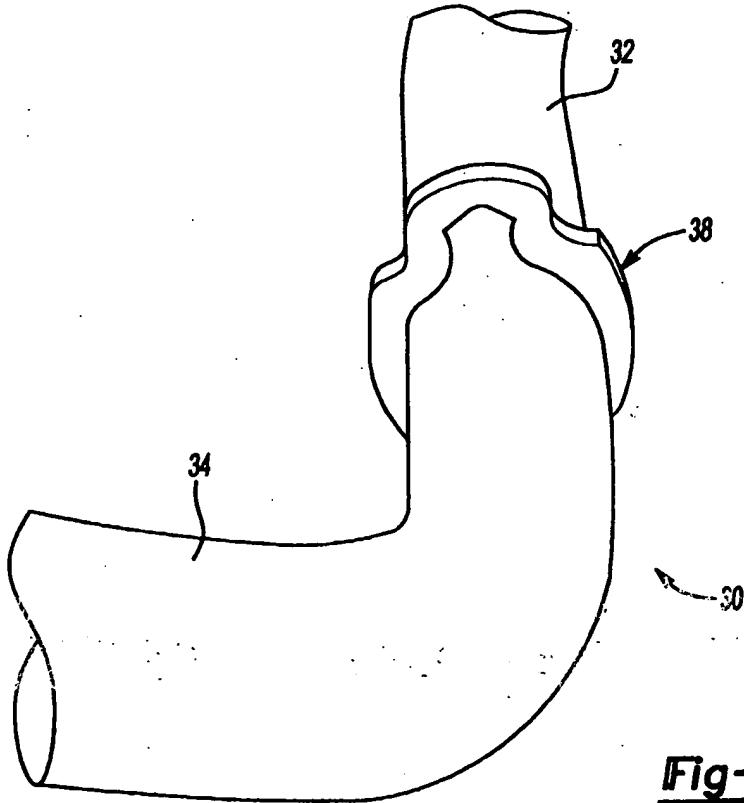


Fig-2

Description**BACKGROUND OF THE INVENTION**

[0001] The present invention relates to a vehicle stabilizer bar, and more particularly to a lateral retainer collar therefor.

[0002] Vehicles are commonly equipped with independent suspension systems for absorbing road shock and other vibrations while providing a smooth and comfortable ride for the vehicle occupants. In suspension systems of this type, a stabilizer bar is often used to increase the roll rigidity and improve the steering stability of the vehicle.

[0003] Typically, the stabilizer bar is a rod-shaped member oriented to extend laterally across the vehicle and an arm segment extending longitudinally at each end of the central segment. The central segment of the stabilizer bar is supported for rotation about its own longitudinal axis by one or more mounting brackets which are fixed to the vehicle body or frame. The distal end of each arm segment is coupled to a control arm of the suspension system by an end link.

[0004] When the vehicle is subjected to a lateral rolling force such as, for example, while the vehicle negotiates a turn, the arm segments pivot in opposite directions with respect to the longitudinal axis of the central segment. As a result, torsional reaction forces are generated which act through the arm segments to urge the control arms to move toward their normal position. Thus, the vehicle body will be prevented from excessive rolling or leaning to either side by the torsional resistance produced by the stabilizer bar.

[0005] The stabilizer bar may shift laterally during suspension articulation. The lateral shift is resisted by a multiple of collars mounted to the central segment of the stabilizer bar. The collars facially engage bushings mounting to the vehicle body or frame to minimize lateral shift of the stabilizer bar.

[0006] The collars are mounted to the stabilizer bar after final shot peening and bending operations are performed to avoid reducing the stabilizer bar integrity. Due to the collar mounting locations and forming requirements, conventional collars are overmolded plastic components. Although effective, overmolded collars may be subject to relatively rapid wear while metallic collars have heretofore been complicated to mount.

[0007] Accordingly, it is desirable to provide an inexpensive collar, which is uncomplicated to mount, yet resists side forces from the stabilizer bar for a prolonged service life without appreciable wear.

SUMMARY OF THE INVENTION

[0008] The anti-shift collar according to the present invention prevents lateral movement of a stabilizer bar assembly. The anti-shift collar has an internal profile that allows it to be mounted onto the bar over previously

formed end. This end is typically a forged spade end and the internal profile of the collar reflects this form. The anti-shift collar is crimped to the central segment of the stabilizer bar and is locked to the central segment there-

[0009] The present invention therefore provide an inexpensive collar which is uncomplicated to mount yet resists side forces from the stabilizer bar for a prolonged service life without appreciable wear.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description of the currently preferred embodiment. The drawings that accompany the detailed description can be briefly described as follows:

- 20 Figure 1 is a general partial phantom view of a vehicle illustrating a suspension system;
- 25 Figure 2 is a perspective view of a stabilizer bar having an anti-shift collar according to the present invention;
- 30 Figure 3 is a plan view of an anti-shift collar prior to crimping;
- 35 Figure 4 is a perspective view of an anti-shift collar prior to crimping; and
- 40 Figure 5 is a plan view of an anti-shift collar after crimping.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] Figure 1 illustrates a general perspective view of an independent front wheel suspension system 10. It should be understood that although a particular suspension is disclosed in the illustrated embodiment, any suspension which utilizes a stabilizer bar will also benefit from the present invention.

[0012] A vehicle frame 12 includes a pair of longitudinal frame rails 14 and a crossbeam 16. Suspension system 10 includes a long lower control arm 18 and a short upper control arm 20 which are both pivotally attached to frame 12. A strut assembly having a helical coil spring 22 and a strut damper 24 is retained between an intermediate portion of lower control arm 18 and frame 12 to support the weight of the vehicle body and any loads which are transmitted through lower control arm 18. Upper control arm 20 is connected to lower control arm 18 by a steering knuckle 26. A hub and rotor assembly 28 is rotatably attached to a spindle portion 27 of steering knuckle 26 such that a wheel and tire (not shown) may be mounted thereon.

[0013] A stabilizer bar assembly 30 includes an elongated central segment 32 which extends laterally across the vehicle and a pair of arm segments 34 which extend longitudinally along the vehicle at each end of central

segment 32. Central segment 32 is rotatably attached to frame rails 14 through a pair of mounting brackets 36. An anti-shift collar 38 is crimped to the central segment 32 (also illustrated in Figure 2) adjacent the mounting brackets 36 to minimize lateral shift of the stabilizer bar 30. Preferably, the anti-shift collar 38 is manufactured of a metallic material such as SAE BS970EN3.

[0014] Referring to Figure 3, the anti shift collar 38 is illustrated prior to crimping. It should be understood that the anti-shift collar 38 may be crimped at any desired location. The anti-shift collar 38 includes a generally elliptical outer perimeter 40. The smaller radius ends 46 adjacent the clipped ends 47 of the elliptical outer perimeter 40 are preferably clipped. That is, the clipped ends 47 are linear and break the elliptical outer perimeter 40.

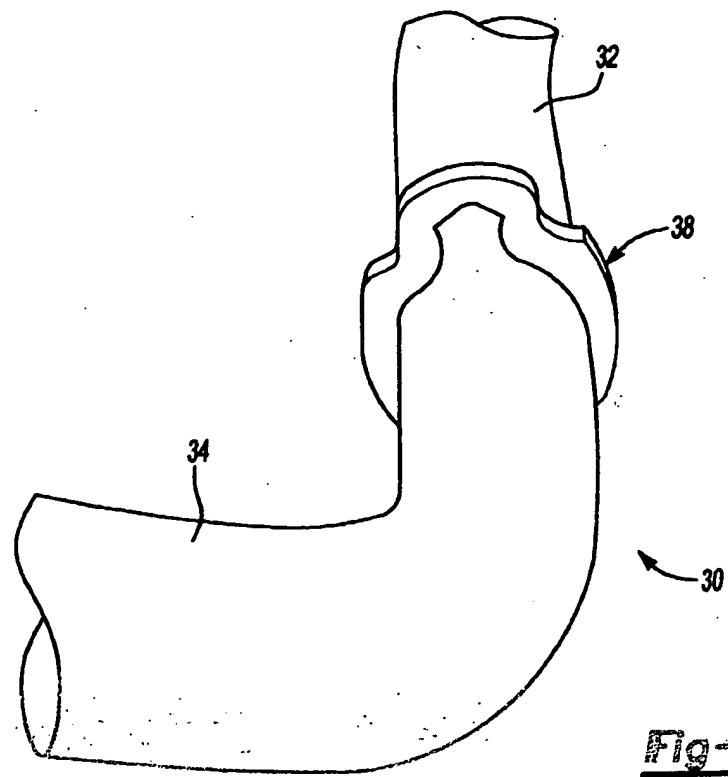
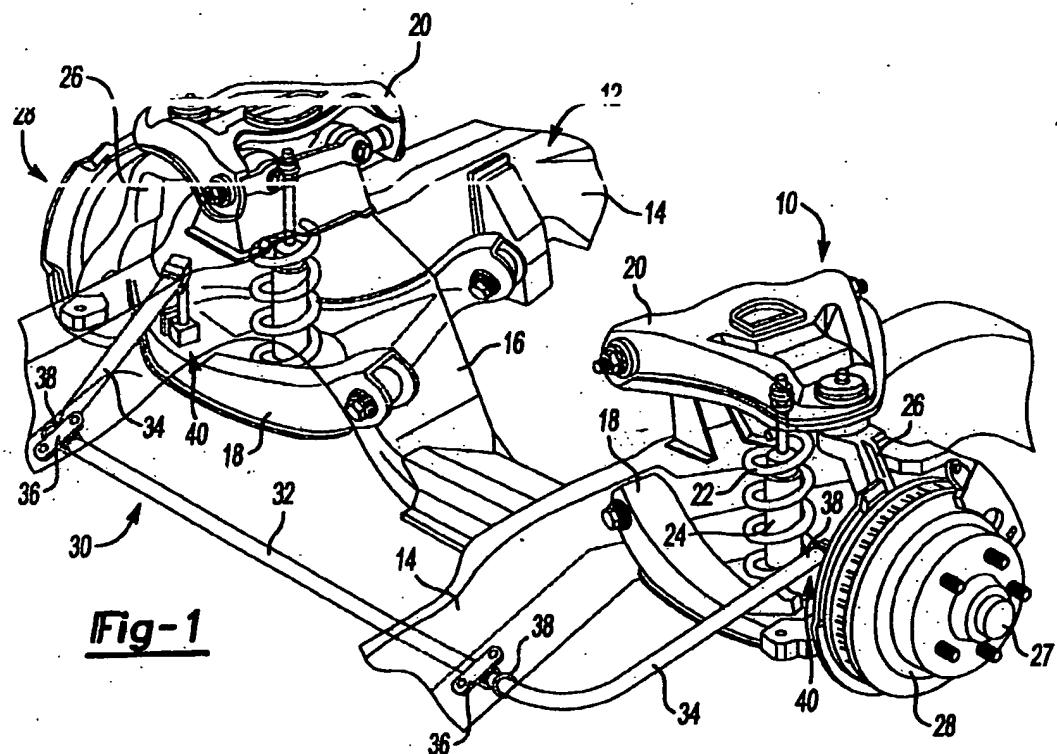
[0015] An inner perimeter 42 includes a circular portion 44 and a polygonal portion 48 adjacent each of the clipped ends 47 of the elliptical outer perimeter 40 (also illustrated in Figure 4). The circular portion 44 is preferably large enough to be received over a finished and shot peened arm segment 34, the elongated central segment 32 and the bends therebetween (Figure 1). In addition, any formed ends such as forged eyes must also be passed therethrough. That is, the polygonal portions 48 allow the anti-shift collar 38 to be slid to a desired position over the formed ends then crimped into place.

[0016] Referring to Figure 5, the anti-shift collar 38 is illustrated after a crimping operation is performed such that the anti-shift collar 38 is locked to the central segment 32 thereby. A crimp (illustrated schematically by arrow C) is preferably made upon the elliptical outer perimeter 40 adjacent each polygonal portion 48. That is, the clipped ends 47 are crimped to form pinched areas 50 to lock the anti-shift collar 38 to the central segment 32 of the stabilizer bar assembly 30. The configuration of the elliptical outer perimeter 40 and the clipped ends 47 advantageously simplifies crimping to two opposed locations. In addition to allowing passage over formed stabilizer ends, the pinched areas 50 take-up the clearance between the circular portion 44 prior to crimping and the central segment 32. A rigid and relatively uncomplicated mounted is thereby provided.

[0017] The foregoing description is exemplary rather than defined by the limitations within. Many modifications and variations of the present invention are possible in light of the above teachings. The preferred embodiments of this invention have been disclosed, however, one of ordinary skill in the art would recognize that certain modifications would come within the scope of this invention. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described. For that reason the following claims should be studied to determine the true scope and content of this invention.

Claims

1. A stabilizer bar assembly comprising:
 - 5 a stabilizer bar and an anti-shift collar crimped to said stabilizer bar, said anti-shift collar comprising an elliptical outer perimeter.
- 10 2. The stabilizer bar assembly as recited in claim 1, wherein said elliptical outer perimeter comprises a clipped end.
- 15 3. The stabilizer bar assembly as recited in claim 1 or 2, wherein said anti-shift collar comprises a semi-circular inner perimeter.
- 20 4. The stabilizer bar assembly as recited in any preceding claim, wherein said anti-shift collar comprises a semi-circular inner perimeter portion with a first and a second polygonal inner perimeter portion.
- 25 5. The stabilizer bar assembly as recited in claim 4, wherein said anti-shift collar is crimped adjacent said first and said second polygonal inner perimeter.
- 30 6. The stabilizer bar assembly as recited in claim 5, wherein said anti-shift collar is crimped in four places.
- 35 7. The stabilizer bar assembly as recited in any preceding claim, wherein said anti-shift collar comprises a metallic material.
- 40 8. A method of mounting an anti-shift collar to a stabilizer bar comprising the steps of:
 - (1) sliding the anti-shift collar over the fully formed stabilizer bar to a desired location; and
 - (2) crimping the anti-shift collar at the desired location on the stabilizer bar said anti-shift collar comprising an elliptical outer perimeter.
- 45 9. A method as recited in claim 8, wherein step (2) further comprises crimping the anti-shift collar on an outer perimeter opposite a first and a second polygonal inner perimeter portion.
- 50 10. A method as recited in claim 8 or 9, wherein step (2) further comprises crimping the anti-shift collar on an outer perimeter to form a first and a second pinched area to lock the anti-shift collar to the stabilizer bar.
- 55 11. A method as recited in claim 8 or 9 or 10, wherein step (2) further comprises crimping the anti-shift collar on an outer perimeter adjacent a clipped end.



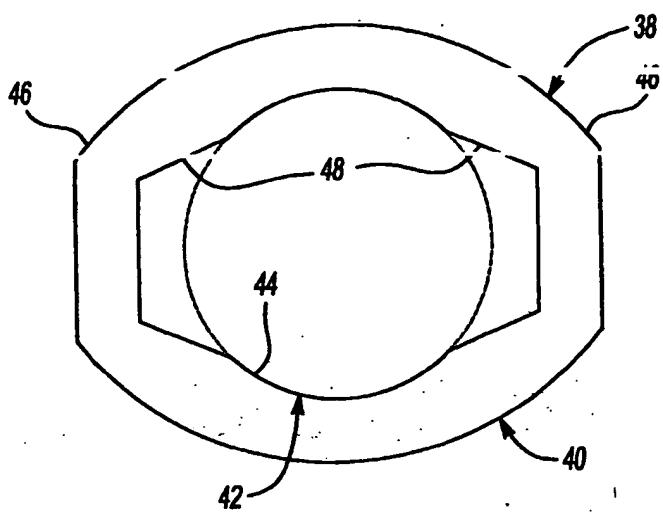


Fig-3

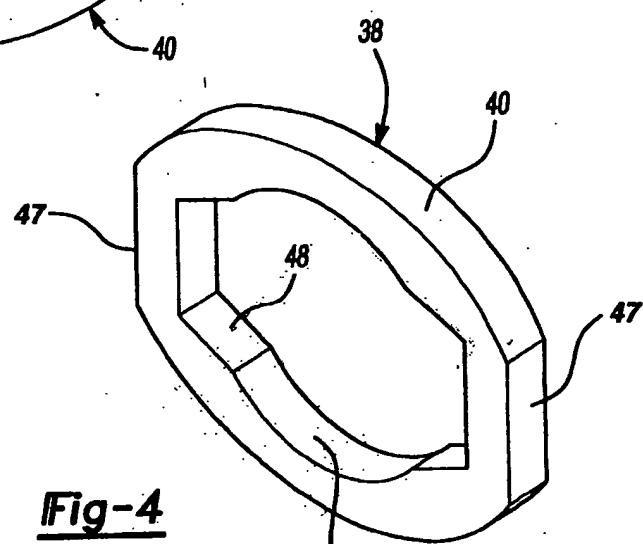


Fig-4

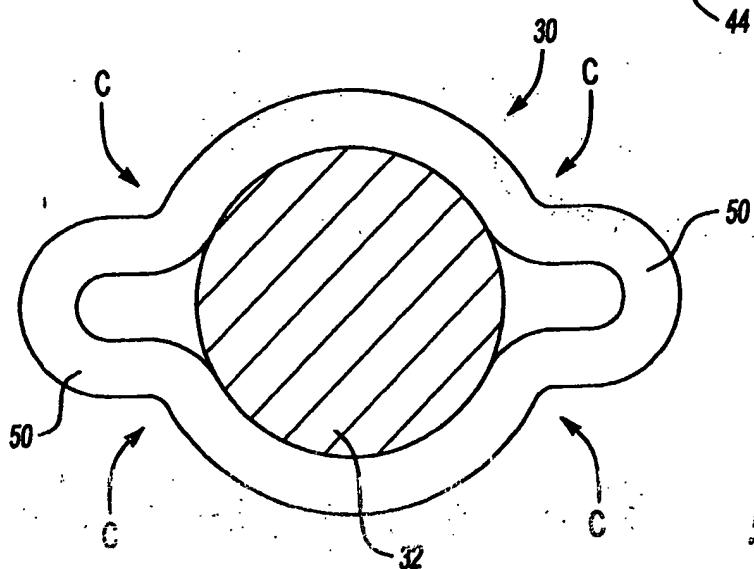


Fig-5



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EUROPEAN SEARCH REPORT

Application Number
FP 94 25 6173

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<p>1 The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search</td> <td>Date of completion of the search</td> <td>Examiner</td> </tr> <tr> <td>Munich</td> <td>4 February 2005</td> <td>Bolte, U</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background C : non-patent literature P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published later, or after the filing date D : document cited in the application L : document cited for other reasons B : member of the same patent family, corresponding document</p>				Place of search	Date of completion of the search	Examiner	Munich	4 February 2005	Bolte, U
Place of search	Date of completion of the search	Examiner							
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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